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Confirmation of a new species of Buthus Leach, 1815 from Alexandria, Egypt (Scorpiones, Buthidae)

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Abstract

During the last decade, the genus Buthus Leach, 1815 (Family Buthidae) was the subject of several studies. These concerned in particular the 'Buthus occitanus' complex of species. Several populations previously considered as subspecies or varieties were raised to the rank of species and many new species were also described. The majority of the species considered in these studies come mostly from Northwest Africa. In a recent paper, the questionable presence of the genus Buthus in Egypt, in other regions than Sinai, was reconsidered and one new species was described from the region of Siwa. In some unpublished notes by E. Simon, the genus Buthus was recorded from Alexandria, but these data were not confirmed subsequently. The material studied by E. Simon was recently 'relocated' in the collections of the Muséum national d'Histoire naturelle in Paris. It is described here as a new species.

Keywords: Scorpion, Buthus, new species, Egypt, Alexandria.

Introduction

As already explained in some recent papers (Lourenço & Cloudsley-Thompson, 2012; Lourenço et al., 2010) the problems and difficulties related to the taxonomy of the genus Buthus Leach were the subject of discussions in already old papers (Kraepelin, 1899). In his monograph about North African scorpions, Vachon (1952) attempted to establish a better definition of the genus and transferred to other genera several species previously included in it (Lourenço, 2003). The classification proposed by Vachon (1952) for the species of Buthus, and in particular for those belonging to the 'Buthus occitanus' complex of species, remained, however, unsatisfactory mainly because of the existence of several poorly defined subspecies and even varieties.

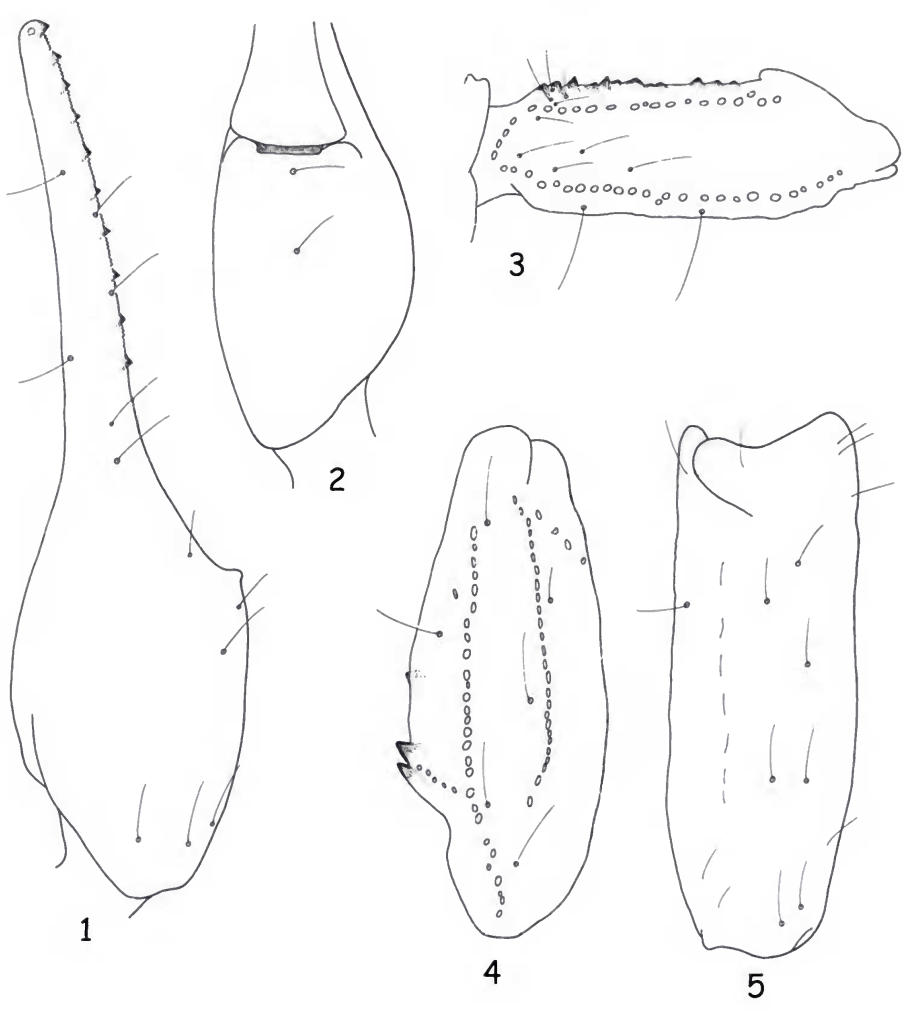
Since the publications by Lourenço (2002, 2003), a more precise definition of the Buthus species belonging to the 'Buthus occitanus' complex, was attempted, followed by the description of several new species and the promotion of some subspecies to species rank (Lourenço, 2002, 2003, 2005, 2008; Lourenço & Slimani, 2004; Lourenço & Vachon, 2004; Lourenço & Qi, 2006; Lourenço et al., 2009a, 2010). This procedure, started by Lourenço, was also followed by other authors (Kovařík, 2006, 2011; Yağmur et al., 2011).

With a few exceptions, most of the recent studies focused on the species distributed in north-western Africa, while little attention was given to the species of the north-eastern regions (Lourenço, 2003). According to the "Catalog of the Scorpions of The World" (Fet & Lowe, 2000) and recent taxonomic elevations, records for two species of the genus Buthus can be attributed to Egypt: B. tunetanus (Herbst, 1800) and B. israelis Shulov & Amitai, 1959. Vachon (1952) limited, however, the distribution of B. tunetanus ("typicus") to Algeria and Tunisia; consequently records for Egypt are questionable. The presence of B. israelis in Egypt is confirmed exclusively for the Sinai Peninsula (Levy & Amitai, 1980; Lourenço et al., 2010).

In a very recent paper (Lourenço & Cloudsley-Thompson, 2012) a new species of Buthus was described from the region of Siwa, based on material collected by our late colleague, Prof. P. M. Brignoli. This new species proved to be quite distinct from both Buthus tunetanus and Buthus barcaeus Birula, 1909; this last species was described from Libya.

Eugène Simon, in some unpublished notes, recorded the genus Buthus from Alexandria in Egypt. This material, composed of several specimens was registered under the n° 3228 of the Simon's collection and designated as "Buthus orientalis sp. n.", but the new species was never published. Curiously, Simon associated also to his new species one specimen from Cyprus, registered under the same number 3228. This specimen was recently studied and proved to be a new species of Buthus described from Cyprus (Yağmur et al., 2011). The Alexandria specimens cited by Simon, however, remained enigmatic. Only very recently I was able to 'locate' the original jar in the collections of the Muséum national d'Histoire naturelle in Paris. The original material registered by Simon under the number 3228, was in fact subsequently divided by M. Vachon in two jars: one under the number RS-6622 with the single female specimen from Cyprus and the second, RS-6623, with the material from Alexandria. The material from Alexandria is composed of several specimens, including males, females and juveniles. A detailed analysis of the material shows it to be distinct from Buthus kunti Yağmur, Koç & Lourenço, 2011, recently described from Cyprus, but also from Buthus tunetanus, B. barcaeus and B. egyptiensis Lourenço & Cloudsley-Thompson, 2012. Consequently, a new species of Buthus from Egypt is described here.

According to Dr. H. El-Hennawy (in litt.) the region of Alexandria today became a very large city surrounded by industrial activities. These activities drastically changed the area in the last 3-4 decades and most certainly destroyed the local fauna. Consequently no scorpion species can be found in this area anymore. Several years ago, Dr. El-Hennawy collected scorpions in the Omayed Protectorate, located about 80 km W of Alexandria. Four species were collected: Androctonus australis (L.), Buthacus leptochelys (Ehrenberg), Leiurus quinquestriatus (Ehrenberg) and Orthochirus innesi Simon. No species of Buthus, however, were found. It can be suggested that Buthus species become very rare or even extinct in the area, as consequence of environmental changes.



Figs. 1-5. Buthus orientalis sp. n., female holotype. Trichobothrial pattern. 1-2. Chela, dorso-external and ventral aspects. 3. Femur, dorsal aspect. 4-5. Patella, dorsal and external aspects.

Methods

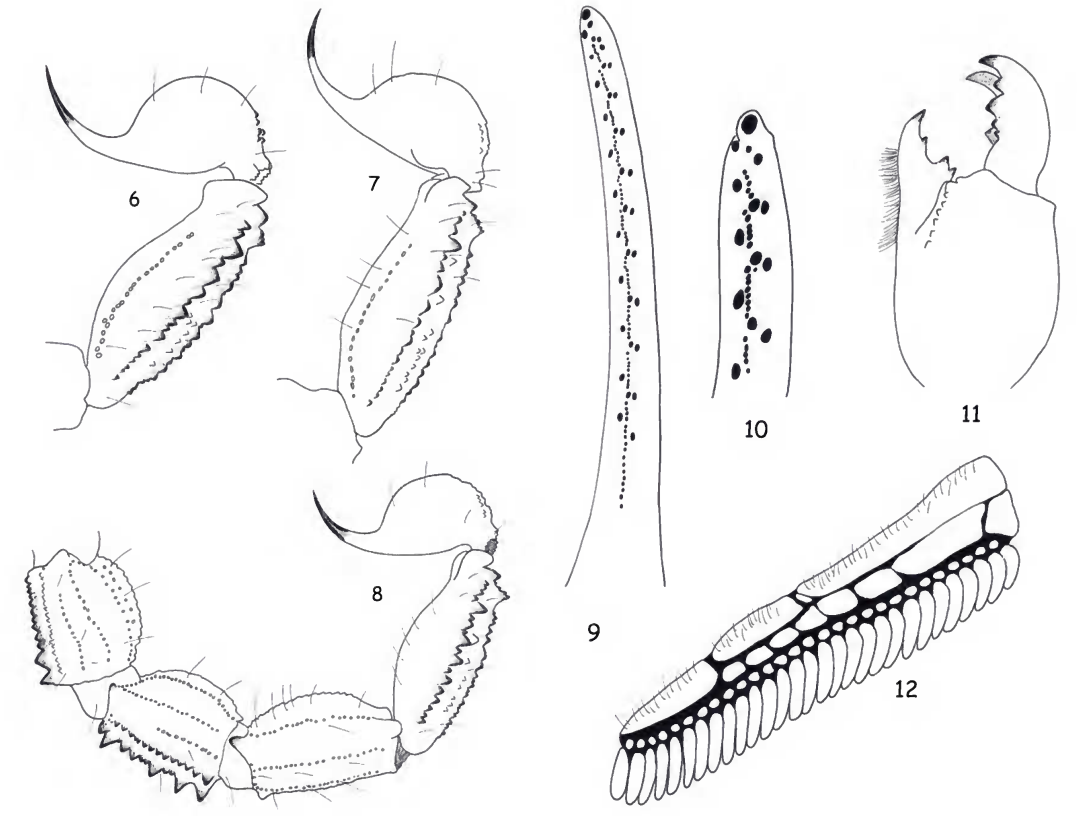
Illustrations and measurements were produced using a Wild M5 stereo-microscope with a drawing tube and an ocular micrometer. Measurements follow Stahnke (1970) and are given in mm. Trichobothrial notations follow Vachon (1974) and morphological terminology mostly follows Vachon (1952) and Hjelle (1990).

Taxonomy

Family Buthidae C. L. Koch, 1837
Genus Buthus Leach, 1815

Buthus orientalis sp. n. (Figs. 1-12)

Type material. Female holotype, 7 males and 13 females paratypes. Egypt, Alexandria, no date, collector unknown, Simon's collection N° 3228; deposited in the Muséum national d'Histoire naturelle, Paris (RS-6623).



Figs. 6-8. Buthus orientalis sp. n. 6-7. Metasomal segment V and telson lateral aspect. 6. Female holotype. 7. Male paratype. 8. Idem, segments II to V and telson, lateral aspect; female paratype.
Figs. 9-12. Buthus orientalis sp. n., male paratype. 9. Movable finger of pedipalp chela with rows of granules. 10. Extremity of the finger in detail. 11. Chelicera. 12. Pecten.

Comparative material: Buthus barcaeus Birula. Libya, Cyrenaica, Latrun, 12/IV/1954 (K. M. Guichard), 1 female (RS-2639). Tolmeitha, 12/III/1958 (K. M. Guichard), 1 male (RS-2637). Misurata, II/1958 (A. Lukmely), 4 males, 5 females.

Etymology: The specific name is the one originally defined by E. Simon and refers to the eastern distribution of the species in North Africa.

Diagnosis. Scorpion of moderate size for the genus, reaching a total length of 68 mm in males and 62 mm in females. Base colour yellowish with only the carapace marked with brown to blackish spots around median eyes; tergites with one longitudinal brown strip; metasomal segments yellowish; metasomal carinae reddish-yellow; telson yellowish; tip of the aculeus dark, almost blackish. Venter yellowish. Pedipalps yellowish with carinae reddish; legs yellowish without spots. Carinae and granulations moderately to strongly marked; ventral carinae on metasomal segments II and III strongly lobated. All metasomal segments longer than wide; metasomal and pedipalpal chetotaxy weak; pedipalps slender in both sexes with short fingers; fixed and movable fingers with 10 rows of granules. Pectines with 28 to 31 teeth in males (mode 29) and 24 to 27 teeth in females (mode 26).

Relationships. Buthus orientalis sp. n., belongs to the 'Buthus occitanus' complex of species. It can be distinguished from other species of Buthus and in particular from B.

egyptiensis also described from Egypt, and from Buthus barcaeus Birula, 1909 known from Libya by the following characters: (i) smaller global size, (ii) much paler coloration on carapace and tergites, (iii) weaker marked carinae on carapace and tergites, but stronger marked ventral carinae on metasomal segments II and III, lobated, (iv) smaller number of pectinal teeth, (v) weak chetotaxy on pedipalps and metasomal segments, (vi) 10 rows of granules on pedipalp fingers. Moreover, the new species is confirmed for a distinct locality in Egypt.

Taxonomic note: Simon (1910) in his revision of the scorpions of Egypt refers only to Buthus 'sensu stricto' as Buthus europaeus (L.), as a common species in the Lower Egypt. He insisted, however, to the fact that he was not able to found valuable characters to distinguish the forms from Egypt from those from Algeria or Spain. No references are made to the 'new species' Buthus orientalis sp. n. From the date of his notes, it can be suggested that he took the decision to describe this new species after the publication of his 1910 paper. Also, this material was not examined by K. Kraepelin when he visited the Muséum in Paris in 1900.

Table 1. Morphometric values (in mm) of female holotype and male paratype of Buthus orientalis sp. n., male and female of Buthus barcaeus from Libya, female holotype of Buthus egyptiensis and a female of Buthus tunetaus from Libya.

	Buthus orientalis		Buthus barcaeus		Buthus egyptiensis	Buthus tunetanus
	♂	♀	♂	♀	♀	♀
Total length*	67.3	61.6	68.6	69.1	85.6	68.3
Carapace:						
- length	6.6	6.8	7.2	7.5	9.2	7.4
- anterior width	4.4	4.8	4.9	5.4	6.3	5.5
- posterior width	7.0	8.2	7.7	8.7	10.8	8.8
Mesosoma length	14.1	15.8	17.3	19.1	26.0	19.0
Metasomal segment I:						
- length	5.5	5.1	5.8	5.4	6.7	5.4
- width	4.6	4.7	5.4	4.8	6.2	5.4
Metasomal segment V:						
- length	8.4	8.2	8.4	8.5	10.2	8.4
- width	3.4	3.8	4.0	4.6	5.1	4.1
- depth	2.9	3.4	3.3	3.4	4.4	3.3
Telson length	6.7	6.9	7.5	7.9	9.1	7.8
Vesicle:						
- width	2.9	3.4	3.2	3.7	4.2	3.5
- depth	2.8	3.1	3.2	3.7	3.7	3.2
Pedipalp:						
- Femur length	5.7	5.7	6.1	6.0	7.1	6.3
- Femur width	1.7	1.9	2.1	2.2	2.7	2.1
- Patella length	6.6	6.9	7.0	7.3	8.7	7.2
- Patella width	2.5	2.8	2.8	3.0	3.8	2.8
- Chela length	10.4	11.5	11.0	12.2	15.2	12.2
- Chela width	2.2	2.7	2.3	2.8	4.2	3.2
- Chela depth	2.4	2.9	2.6	3.2	4.5	3.6
Movable finger:						
- length	6.9	7.5	7.4	8.3	9.5	7.8

* Including telson length

Description based on female holotype and paratypes. Measurements on Table (1).

Coloration. Base colour yellowish. Prosoma: carapace yellowish with some infuscated zones around median eyes which are marked by brown to blackish pigment.

Mesosoma: yellowish with tergites marked by one dark longitudinal strip; carinae are slightly reddish. All metasomal segments yellowish; carinae reddish; vesicle yellowish; aculeus yellowish at its base and dark at its extremity. Venter yellowish; pectines pale yellow. Chelicerae yellowish without variegated spots; fingers yellowish with dark reddish teeth. Pedipalps yellowish with some carinae reddish; without any spot; fingers with the oblique rows of granules dark to blackish. Legs yellowish, without spots.

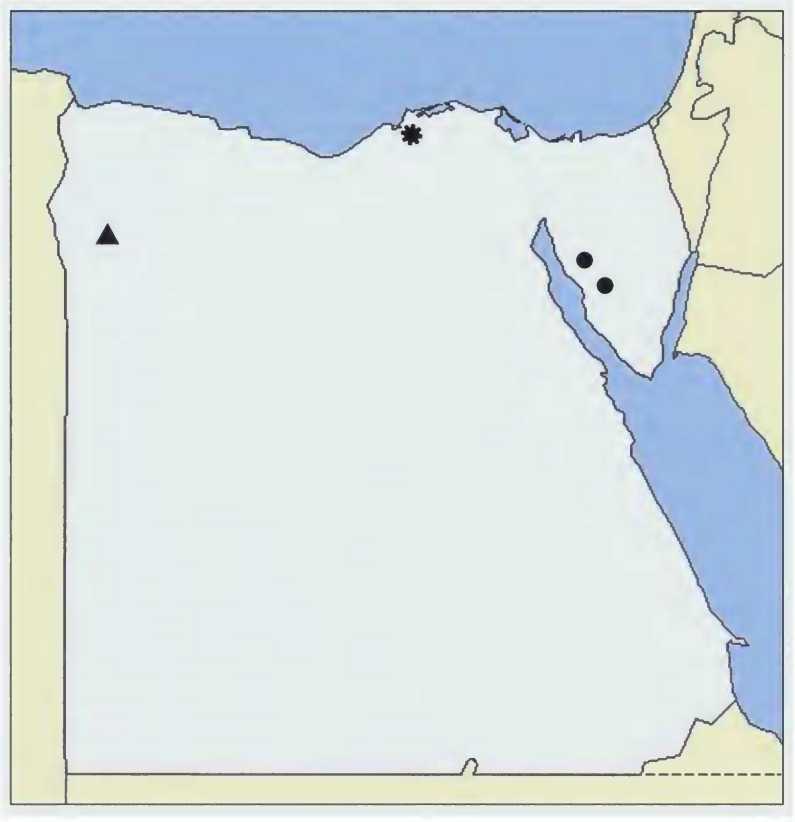


Fig. 13. Map of Egypt, showing the type localities of the new species (black asterisk), and that of Buthus egyptiensis (black triangle). The distribution of Buthus israelis in Sinai is indicated by black circles.

Morphology. Carapace moderately granular; anterior margin without any median concavity, almost straight. Carinae strong; anterior median, central median and posterior median carinae strongly granular, with 'lyre' configuration. All furrows moderate to strong. Median ocular tubercle at the centre of carapace. Eyes separated by almost three ocular diameters. Four pairs of lateral eyes: the first three of moderate size, the last only vestigial. Sternum triangular and short; wider than long. Mesosoma: tergites moderaly granular. Three longitudinal carinae moderately to strongly crenulate in all tergites; lateral carinae reduced in tergites I and II. Tergite VII pentacarinate. Venter: genital operculum divided longitudinally in two semi-oval plates. Pectines: pectinal tooth count 26-26 in female holotype (see diagnosis for variation); middle basal lamella of the pectines not dilated. Sternites without granules, smooth with elongated spiracles; four weak to vestigial carinae on sternites VI and VII; other sternites acarinated and with two vestigial furrows. Metasomal segments I to III with 10 moderately to strongly crenulated carinae, ventral carinae strongly marked on segments II and III with lobate denticles; segment IV with 8 carinae, moderately crenulated; the first four segments with a smooth

dorsal depression; segment V with five carinae; the latero-ventral carinae crenulate with 3-4 lobate denticles posteriorly; ventral median carina not divided posteriorly; anal arc composed of 7-8 ventral teeth, and two lateral lobes. Intercarinal spaces weakly granular to smooth. Chetotaxy weak. Telson with a strongly globular vesicle, almost smooth; aculeus weakly curved and slightly shorter than the vesicle, without a subaculear tooth. Cheliceral dentition as defined by Vachon (1963) for the family Buthidae; external distal and internal distal teeth approximately the same length; basal teeth on movable finger small but well distinct; ventral aspect of both fingers and manus covered with long dense setae. Pedipalps: femur pentacarinate; patella with eight carinae weakly marked; chela without carinae, smooth. Fixed and movable fingers with 10 oblique rows of granules. Internal and external accessory granules present, strong; three accessory granules on the distal end of the movable finger next to the terminal denticle. Chetotaxy weak. Legs: tarsus with two longitudinal rows of spinoid setae ventrally; tibial spur strong on legs III and IV; pedal spurs moderate to strong on legs I to IV. Trichobothriotaxy: trichobothrial pattern of Type A, orthobothriotaxic as defined by Vachon (1974). Dorsal trichobothria of femur arranged in Beta-β-configuration (Vachon, 1975).

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